

## CLAIMS

1. A method for transmitting data from a transmitter unit to a receiver unit in a multiple-input multiple-output (MIMO) communication system, comprising:
  - at the receiver unit,
    - receiving a plurality of signals via a plurality of receive antennas, wherein the received signal from each receive antenna comprises a combination of one or more signals transmitted from the transmitter unit,
    - processing the plurality of received signals to provide estimates of modulation symbols transmitted from the transmitter unit,
    - estimating signal-to-noise-plus-interference (SNR) of a plurality of transmission channels used for data transmission, and
    - transmitting SNR estimates for the transmission channels back to the transmitter unit; and
  - at the transmitter unit, processing data for transmission to the receiver unit in accordance with the received SNR estimates.
2. The method of claim 1, wherein the SNR of each of the plurality of transmission channels is estimated, and the SNR estimates for each transmission channel is transmitted back to the transmitter unit.
3. The method of claim 1, further comprising:
  - at the receiver unit,
    - deriving characterizations for the plurality of transmission channels used for data transmission, and
    - transmitting the characterizations back to the transmitter unit.
4. The method of claim 3, further comprising:
  - at the transmitter unit, pre-conditioning modulation symbols prior to transmission to the receiver unit in accordance with characterizations for the plurality of transmission channels.

5. The method of claim 1, wherein the received modulation symbols are processed in accordance with a channel correlation matrix inversion (CCMI) scheme.
6. The method of claim 1, wherein the received modulation symbols are processed in accordance with a minimum unbiased mean square error (UMMSE) scheme.
7. The method of claim 1, wherein the processing at the transmitter unit includes coding data for each transmission channel in accordance with the received SNR estimate for the transmission channel.
8. The method of claim 7, wherein the processing at the transmitter unit further includes modulating coded data for each transmission channel based on a modulation scheme selected based on the received SNR estimate for the transmission channel.